

## CAREX BRYSONII AND CAREX GODFREYI, NEW SPECIES OF CAREX SECTION GRISEAE (CYPERACEAE) FROM THE SOUTHEASTERN UNITED STATES

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The sedges constituting *Carex* section *Griseae* (L. H. Bailey) Kükenthal belong to subgenus *Carex* and possess glabrous leaf and bract blades, long-sheathing lower bracts, staminate terminal spikes, and glabrous perigynia with numerous (usually 40 or more) impressed nerves. Section *Griseae* [including sect. *Oligocarpae* (Carey) Mackenzie] contains 18 taxa, all endemic to eastern North America. The group is most diverse in the southeastern United States, the region inhabited by three of the section's four recently described species (Bryson et al. 1987; Kral et al. 1987; Bridges & Orzell 1989; Naczi 1989). The Southeast continues to yield new species of sect. *Griseae*; here I describe two new species from this area. Recognition of these taxa as new species results from ongoing research on the systematics of *Carex* sect. *Griseae* and exploration of localities and habitats in the Southeast with previously poorly known sedge floras.

***Carex brysonii*** Naczi, sp. nov.—TYPE: USA. Alabama: Winston Co., [ca. 16 km (10 mi) N of Double Springs], Bankhead National Forest, Sipsy River Recreation Area, NE of Sipsy Fork, S of Winston Co. highway 60, T9S, R8W, Sect. 8, 15 May 1992, *Bryson 11610* (holotype: MICH!; isotypes: BM! BRIT/SMU! CAN! F! GA! GH! IBE! MO! NCU! NY! PH! TAES! TENN! UNA! US! VDB! VSC! WARM! ctb!). Figs. 1a, c, e, 2a, b.

Herba perennis, dense caespitosa. Rhizomata brevia, 0.2–1.0 mm longa inter surculos vel ramos rhizomatium, internodiis 0.2–1.0 mm longis, 2.4–2.7 mm crassis. Bases surculorum stramineae vel cinnamomeae. Culmi fertiles 26–63 cm alti, 0.5–0.8 mm lati in medio, sparsim antrorse scaberuli vel laeves. Folia 3–5; laminae 3.3–24 cm longae, 2.4–5.3 (–5.8) mm latae, lamina latissima (3.4–) 3.7–5.3 (–5.8) mm lata, glaucescentes, paginis abaxialibus laevibus vel papillatis; vaginae scabrae. Surculi vegetativi 8.7–56 cm alti; pseudoculmi 4.1–19 cm alti. Inflorescentiae 6.4–54 cm longae; spicae separatae vel 2–4 superae imbricatae; spicae infimae remotae. Spicae (3–) 4–5 (–6), erectae; spica terminalis (1.2–) 1.8–4.6 cm longa, 1.4–2.6 mm lata, omnino mascula, in pedunculo erecto 6.6–29 (–42) mm longo portata, spicas superas laterales vix vel multo superans; spica infima 0.9–2.8 cm longa, 3.8–4.7 mm lata, omnino feminea vel raro androgyna, in pedunculo erecto (0.9–) 2.3–13.2 cm longo portata; spicae laterales 0.6–2.6 cm longae, 3.8–6.8 mm latae, omnino femineae vel raro androgynae, in pedunculis erectis 0.3–4.9 cm longis portatae; flores feminei spicarum lateralium (2–) 3–8 spiralliter imbricati, internodio inter flores infimos (2.6–) 4.5–7.3 (–9.3) mm longo. Squamae femineae (3.5–) 4.1–6.1 mm longae, 1.3–2.0 mm latae, aristatae; corpus (2.0–) 2.5–3.2 (–3.8) mm longum, late ovatum vel ovatum, integrimarginatum; arista (0.1–) 1.2–3.6 mm

longa. Perigynia (3.7-) 4.0-4.7 (-5.1) mm longa, 1.5-1.7 (-1.8) mm lata, (2.2-) 2.5-3.1 plo longiora quam latiora, ascendentia, obtuse trigona, nervata, glabra, ellipsoidea vel anguste ellipsoidea vel obovoidea vel anguste obovoidea, in basim angustam subacutam gradatim contracta, in rostrum laeve plus minusve excurvatum integrum (0.5-) 0.6-1.0 longum abrupte contracta; nervi 49-58 impressi. Achenia (2.5-) 2.7-3.5 mm longa, 1.4-1.6 mm lata, late obovoidea-ellipsoidea vel obovoidea-ellipsoidea, in stipitem 0.3-0.5 (-0.6) mm longum abrupte contracta, arcte inclusa perigyniis; corpus 2.1-2.7 mm longum.

Perennial herb, densely caespitose. Rhizomes short, 0.2-1.0 mm long between shoots or branches of the rhizomes, with internodes 0.2-1.0 mm long, 2.4-2.7 mm thick, covered with cataphylls 2-3.5 mm long. Shoot bases not surrounded by bases of old leaves, stramineous to cinnamon. Fertile culms 26-63 cm tall, 0.5-0.8 mm wide at mid-height, trigonous, erect to spreading, elongating slightly in fruit, sparsely antrorsely scaberulous-angled or smooth. Cataphylls scabrous, stramineous to cinnamon, multicostate. Leaves 3-5, arising in basal 0.01-0.2 (-0.6) of fertile culms, the longest 0.3-0.5 times as long as fertile culms; blades 3.3-24 cm long, 2.4-5.3 (-5.8) mm wide, the widest (3.4-) 3.7-5.3 (-5.8) mm wide, glaucescent, flat to barely plicate, margins antrorsely scaberulous or smooth, adaxial surface smooth or sparsely antrorsely scaberulous on main veins, abaxial surface smooth or papillate, papillae especially on leaves produced during previous season; leaf sheaths 2.1-10.4 cm long, tight, scabrous, glaucescent with bases stramineous to cinnamon; adaxial face of sheaths with hyaline and glabrous or apically sparsely scabrous band, hyaline band with apex slightly concave to slightly convex; ligules 1.2-4.7 mm long, lingulate with apex obtuse. Vegetative shoots 8.7-56 cm tall, 0.65-1.2 times as tall as culms; leaves 3-6, similar to those of fertile culms except blades 1.0-46 cm long; pseudoculms 4.1-19 cm tall, 1.9-3.2 mm wide, 0.28-0.39 of vegetative shoot height. Inflorescences 6.4-54 cm long, 0.22-0.86 of culm height, with spikes separate or upper 2-4 spikes overlapping; the uppermost lateral spikes 1.5-3.4 cm distant; the lowest spikes separate, (2.2-) 6.6-26 cm distant; lowest bract blade 5.6-22.9 cm long, sheath 0.6-7.4 cm long, adaxial face of sheath with glabrous and hyaline band usually occupying full length of sheath, hyaline band with apex slightly convex and elongated 0.3-2.3 mm above sheath apex, sheath scabrous abaxially, ligule 0.7-3.4 mm long; bract blade of uppermost lateral spike (0.7-) 2.0-6.3 (-8.2) cm long and overlapping but not exceeding terminal spike, sheath 1.3-2.6 mm long and glabrous or sparsely scabrous abaxially; uppermost bract subtending terminal spike and scale-like, sheathless, body 3.9-5.0 mm long, awn 0-7.9 mm long. Spikes (3-) 4-5 (-6), simple, single at nodes, erect; terminal spike (1.2-) 1.8-4.6 cm long, the longest (2.5-) 3.0-4.6 cm long, 1.4-2.6 mm wide, entirely staminate, 13-116-flowered, on erect peduncle 6.6-29 (-42) mm long, barely to much exceeding upper lateral spikes; lowest spike 0.9-2.8 cm long, 3.8-4.7 mm wide, entirely pistillate and (2-) 3-6-flowered or rarely androgynous with 4-5 pistillate and 1-3 staminate flowers, the flowers spirally imbricate, the internode between the lowest flowers (2.6-) 4.5-7.3 (-9.3) mm long, on erect peduncle (0.9-) 2.3-13.2 cm long; lateral spikes 0.6-2.6 cm long, 3.8-6.8 mm wide, entirely pistillate and (2-) 4-8-flowered or rarely androgynous with 3-8 pistillate and 1-7 staminate flowers, on erect peduncles 0.3-4.9 cm long. Staminate scales 3.8-4.3 mm long, 1.3-1.6 mm wide, narrowly oblong-obovate to oblong-obovate, obtuse to acute, awnless, center green and 1-nerved, margins hyaline and whitish to pale stramineous. Pistillate scales (3.5-) 4.1-6.1 mm long, 1.3-2.0 mm wide; body (2.0-) 2.5-3.2 (-3.8) mm long, broadly ovate to ovate with midrib prolonged

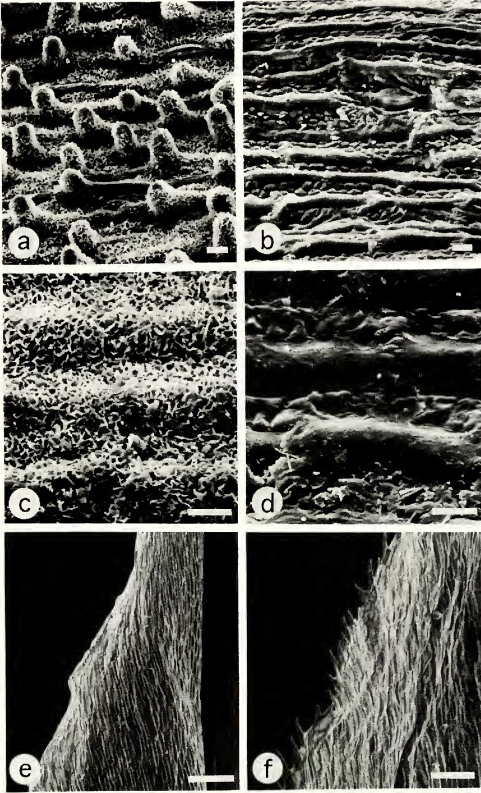


FIG. 1. Scanning electron micrographs of leaf surfaces and pistillate scale margins of *Carex brysonii* and *C. hitchcockiana*. a-b, abaxial surfaces of overwintered leaves: a. *C. brysonii* (Bryson 4385). b. *C. hitchcockiana* (Naczi 1945). c-d, adaxial surfaces of overwintered leaves: c. *C. brysonii* (Bryson 4385). d. *C. hitchcockiana* (Naczi 1945). e-f, margins of pistillate scale bodies, near apex of body: e. *C. brysonii* (Naczi 2874). f. *C. hitchcockiana* (Naczi 1945). Scale: bars in a-d = 0.01 mm; bars in e-f = 0.1 mm.

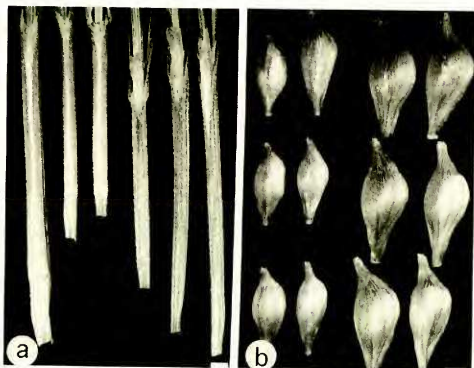


FIG. 2. Bract sheaths and perigynia of *Carex brysonii* and *C. hitchcockiana*. a, adaxial face of lowest bract sheath: left three sheaths *C. brysonii* (Naczi 2874), right three sheaths *C. hitchcockiana* (Naczi 2546). b, side view of perigynia: left two columns *C. brysonii* (Bryson 4385), right two columns *C. hitchcockiana* (Naczi 2546). Scale bars = 1 mm.

as antrorsely scaberulous awn (0.1–) 1.2–3.6 mm long, center green and 1–3-nerved, margins entire, hyaline, whitish. Anthers 3, 2.9–3.4 mm long. Styles jointed with achenes, withering; stigmas 3, 2.4–3.3 mm long. Perigynia (3.7–) 4.0–4.7 (–5.1) mm long, 1.5–1.7 (–1.8) mm wide, (2.2–) 2.5–3.1 times as long as wide, ascending, obtusely trigonous with faces flat to slightly convex, with many fine and deeply impressed nerves on each face, the total number of nerves 49–58, glabrous, green to red-brown, fusiform, ellipsoid or narrowly ellipsoid to obovoid or narrowly obovoid, gradually tapered to narrow and subacute base, abruptly contracted to beak; beak (0.5–) 0.6–1.0 mm long, 0.12–0.22 of perigynium length, smooth, slightly excurved, entire. Achenes (2.5–) 2.7–3.5 mm long, 1.4–1.6 mm wide, tightly enveloped by perigynia, broadly obovoid-ellipsoid to obovoid-ellipsoid, obtusely trigonous with faces slightly concave to flat, brown, basally abruptly contracted to stipe, apically abruptly contracted to beak; stipe 0.3–0.5 (–0.6) mm long, straight; body 2.1–2.7 mm long, 0.49–0.60 times as long as perigynium, with widest point 0.9–1.2 mm from body apex; beak 0.2 mm long, bent 30–70° from vertical.

ADDITIONAL SPECIMENS EXAMINED. ALABAMA. Lawrence Co.: [ca. 19 km (11.6 mi) N of Double Springs], Bankhead National Forest, W side of Borden Creek, T8S, R8W, Sect. 32, *Bryson 11619* (MICH, US, VDB, ctb). Winston Co.: type locality, *Bryson 4385* (DOV, IBE, MICH, MO, NLU, PH, UNA, VDB, ctb). *Naczi 2874* (GH, MICH, NY, UNA, US, VDB, ctb); Bankhead National Forest, SE of Sipsey River Recreation Area, W side of river, [T9S, R8W], Sect. 10, *Bryson 2536* (MICH, ctb); Bankhead National Forest, SE by ca. 1 mi from Sipsey River Recreation Area, T9S, R8W, Sect. 9, *Bryson 4381* (BRIT/SMU, LSU, MICH, MO, MSC, NLU, PH, TAES, UARK, VDB, VSC, ctb).

TABLE 1. Morphologic characters distinguishing *Carex brysonii* from *C. hitchcockiana*.

	<i>C. brysonii</i>	<i>C. hitchcockiana</i>
leaf color	glaucous	deep green
abaxial surface of overwintered leaves	usually papillate	smooth or sparsely scabrous on midrib
hyaline band of lowest bract sheath, length relative to sheath	usually as long as sheath	much shorter than sheath
bract blade of uppermost lateral spike, length relative to terminal spike	shorter than or equalling terminal spike	usually much exceeding terminal spike
longest terminal spike, length (mm)	(25-) 30-46	(3.4-) 14-34 (-42)
pistillate scale margins	entire	denticulate
perigynium, length (mm)	(3.7-) 4.0-4.7 (-5.1)	(4.5-) 4.6-5.6 (-6.2)
perigynium, width (mm)	1.5-1.7 (-1.8)	1.9-2.2 (-2.3)

Morphologically, *C. brysonii* is most similar to *C. hitchcockiana* Dewey. These two are the only taxa in sect. *Griseae* to have scabrous leaf and bract sheaths. In addition, *C. brysonii* and *C. hitchcockiana* share brown shoot bases, relatively wide leaves [the widest leaf blade per plant (3.0-) 3.5-5.3 (-6.5) mm wide], perigynia tightly enveloping the achenes, and perigynia with excurved beaks. Numerous morphologic characters distinguish the two species (Table 1). The abaxial surfaces of the leaf blades of *C. brysonii* are smooth or papillate. Leaves produced during the previous season (overwintered leaves) are most often papillate, whereas leaves produced early in the current season are usually smooth. Thus, only some of the leaves per specimen are papillate, but every specimen I have examined bears at least a few papillate leaves. The papillae, which are minute (barely visible with 10 $\times$  magnification), densely cover the leaf surface (Fig. 1a). In contrast, the abaxial surfaces of the leaf blades of *C. hitchcockiana* are smooth or sparsely scabrous on the midribs (Fig. 1b). The leaf blades of *C. brysonii* bear a thin covering of wax, both abaxially (Fig. 1a) and adaxially (Fig. 1c). This wax, which may be worn off old leaves, causes the leaves to be glaucous. *Carex hitchcockiana* lacks this wax covering on both surfaces of its deep green leaves (Figs. 1b, d). In *C. brysonii*, the hyaline band of the lowest bract sheath usually occupies the full length of the sheath and is elongated above the sheath apex only 0.3-2.3 mm (Fig. 2a). *Carex hitchcockiana*, on the other hand, has the hyaline band of the lowest bract sheath confined to the upper portion of the sheath and elongated above the sheath apex (0.6-) 1.0-5.6 (-6.6) mm (Fig. 2a). The bract blade of the uppermost lateral spike overlaps but does not exceed the terminal spike in *C. brysonii*, but usually much exceeds it in *C. hitchcockiana*. In addition, the terminal spikes of *C. brysonii* are longer than those of *C. hitchcockiana*. The pistillate scale bodies of *C. brysonii* have entire margins (Fig. 1e), whereas those of *C. hitchcockiana* are denticulate (Fig. 1f). Furthermore, the perigynia of *C. brysonii* are shorter and narrower than the perigynia of *C. hitchcockiana* (Fig. 2b).

In size and shape, the perigynia of *C. brysonii* are almost identical to those of *C. asynchrone* Naczi. Many other characters differentiate these two species, though. Unlike *C. brysonii*, *C. asynchrone* possesses pale green leaf blades that lack papillae and are relatively narrow [the widest blade per plant only 2.5-4.0 mm wide versus (3.4-) 3.7-5.3 (-5.8) mm wide for *C. brysonii*], smooth leaf and bract sheaths,

relatively short terminal spikes [the longest spike per plant only 17–27 (–35) mm long versus (25–) 30–46 mm], and quite crowded upper spikes [only 0.7–1.5 (–2.2) cm between the uppermost lateral spikes versus 1.5–3.4 cm].

*Carex brysonii* grows in shaded, moist, sandy loam on slopes above streams in forests dominated by *Acer saccharum* Marsh., *Carpinus caroliniana* Walt., *Fagus grandifolia* Ehrh., *Liriodendron tulipifera* L., *Magnolia macrophylla* Michx., *Pinus* sp., and *Tsuga canadensis* (L.) Carr. *Carex communis* L. H. Bailey, *C. oligocarpa* Willd., and *C. picta* Steud. associate closely with *C. brysonii*. I have seen only 6 collections of *C. brysonii*, despite examining specimens of sect. *Griseae* from over 60 herbaria. Apparently first collected in 1979 (Bryson 2536) and known only from along a short portion of the Sipsey Fork of the Black Warrior River and an immediately confluent portion of Borden Creek, *C. brysonii* appears to be a narrow endemic to gorges of the upper Sipsey Fork drainage. At least one other vascular plant taxon is endemic to these gorges, *Thelypteris pilosa* var. *alabamensis* Crawford (Norquist 1991). The upper Sipsey Fork drainage, in the Cumberland Plateau (Appalachian Plateaus) physiographic province, is also noteworthy for harboring the southernmost populations known of several species of *Carex* of eastern North American mesic forests: *C. careyana* Dewey, *C. gracillima* Schwein., *C. laxiflora* Lam. var. *laxiflora*, and *C. pedunculata* Willd. (Bryson 1980; Kral 1981; Naczi & Bryson 1990), but not "*C. hitchcockiana*" as noted by Naczi and Bryson (1990: 51), which is *C. brysonii*. Occurring farther south than *C. hitchcockiana*, *C. brysonii* is disjunct approximately 100 kilometers (60 miles) from the nearest known population of *C. hitchcockiana* [ALABAMA. Madison Co.: NE of Monte Sano Mt., between Monte Sano State Park and Hwy 72, *Bryson 2046* (FLAS, ctb)].

In appreciation for the many ways he has assisted me in my studies of *Carex*, I name this species for Dr. Charles T. Bryson, avid student of the genus, discoverer of the species, and friend. Charles's insistence that I see *C. brysonii* in the field induced me to visit what is now the type locality, carefully examine the plant, and consequently comprehend its uniqueness.

***Carex godfreyi* Naczi, sp. nov.**—TYPE: U.S.A. Florida: Lake Co., Astor Park, 0.2 mi E of routes 40 & 445A junction, along N side of route 40, 22 Apr 1991, *Naczi 2781* (holotype: MICH!; isotypes: FLAS! FSU! NCU! NY! US! VDB! ctb!). Fig. 3a, b.

Herba perennis, dense vel laxe caespitosa. Rhizomata brevia vel longa, 0.2–38 mm longa inter surculos vel ramos rhizomatum, internodiis 0.2–12.4 mm longis, 1.2–2.0 mm crassis. Bases surculorum atrovinosae usque ad (3.4–) 4.0–7.3 cm. Culmi fertiles 7.8–65 (–85) cm alti, 0.4–0.9 mm lati in medio, laeves. Folia 2–4; laminae 1.4–34 cm longae, 1.1–4.0 (–5.3) mm latae, lamina latissima 2.4–4.0 (–5.3) mm lata, virides, paginis abaxialibus laevibus; vaginae glabrae. Surculi vegetativi 23–63 cm alti; pseudoculmi 3.3–12.9 cm alti. Inflorescentiae 3.8–58 cm longae; spicae 2–4 superae imbricatae; spicae infimae remotae. Spicae (3–) 4–5 (–6), erectae; spica terminalis 0.7–3.7 (–4.6) cm longa, 1.0–2.9 mm lata, omnino mascula, in pedunculo erecto 1.6–22 (–51) mm longo portata, spicas superas laterales vix superans; spica infima 0.5–1.9 cm longa, 4.6–7.0 mm lata, omnino feminea, in pedunculo erecto vel arcuato 2.9–13.3 (–18.1) cm longo portata; spicae laterales 0.7–2.6 cm longae, 4.6–9.2 mm latae, omnino femineae vel raro androgynae, in pedunculis erectis 0.1–4.9 cm longis portatae; flores feminei spicarum lateralium

3–19 spirally imbricati, internodio inter flores infimos 1.8–3.3 (–6.2) mm longo. Squamae femineae 2.1–5.3 mm longae, 1.2–2.4 mm latae, aristatae; corpus 1.7–2.8 mm longum, late ovatum vel ovatum, integrimarginatum; arista (0–) 0.2–3.3 mm longa. Perigynia (4.0–) 4.3–5.0 (–5.6) mm longa, 1.5–1.9 (–2.1) mm lata, 2.4–2.9 (–3.2) plo longiora quam latiora, ascendente, obtuse trigona, nervata, glabra, ellipsoidea vel anguste ellipsoidea vel obovoidea vel anguste obovoidea, in basim latam truncatam gradatim contracta, in apicem subacutum rectum vel vix excurvatum gradatim contracta, erostrata vel rostro minuto laevi recto integro usque ad 0.2 mm longo instructa; nervi 52–64 impressi. Achenia (3.0–) 3.1–3.5 (–3.7) mm longa, 1.5–1.8 mm lata, late obovoidea vel obovoidea, in stipitem 0.6–0.8 (–0.9) mm longum abrupte contracta, laxe inclusa perigyniis; corpus 2.0–2.4 (–2.6) mm longum.

Perennial herb, densely to loosely caespitose. Rhizomes short to long, 0.2–38 mm long between shoots or branches of the rhizomes, with internodes 0.2–12.4 mm long, 1.2–2.0 mm thick, covered with cataphylls 2–15 mm long. Shoot bases not surrounded by bases of old leaves, dark purple-red to (3.4–) 4.0–7.3 cm high. Fertile culms 7.8–65 (–85) cm tall, 0.4–0.9 mm wide at mid-height, trigonous, erect to spreading, elongating in fruit, smooth. Cataphylls glabrous, red-brown to purple-red, multicostate. Leaves 2–4, arising in basal 0.01–0.3 of fertile culms, the longest 0.1–0.6 times as long as fertile culms; blades 1.4–34 cm long, 1.1–4.0 (–5.3) mm wide, the widest 2.4–4.0 (–5.3) mm wide, green, flat to barely plicate, margins antrorsely scaberulous, adaxial surface smooth or sparsely antrorsely scaberulous on main veins, abaxial surface smooth; leaf sheaths 3.1–9.2 cm long, loose, glabrous, green with bases tinged with purple-red; adaxial face of sheaths with hyaline and glabrous band, hyaline band with apex slightly concave or truncate; ligules 1.8–4.2 (–10.9) mm long, lingulate with apex obtuse or inverted V-shaped with apex acute. Vegetative shoots 23–63 cm tall, 0.6–1.5 times as tall as culms; leaves 4–7, similar to those of fertile culms except blades 5.7–48.5 cm long; pseudoculms 3.3–12.9 cm tall, 1.0–3.8 mm wide, 0.16–0.27 of vegetative shoot height. Inflorescences 3.8–58 cm long, 0.094–0.94 of culm height, with the upper 2–4 spikes overlapping; the uppermost lateral spikes 0.3–8.5 (–19.5) cm distant; the lowest spikes separate, 7.8–31 cm distant; lowest bract blade 8.8–34.4 cm long, sheath 1.1–6.9 cm long, adaxial face of sheath with glabrous and hyaline band occupying full length of sheath or confined to upper portion of sheath, hyaline band with apex slightly concave to slightly convex and elongated 0.1–0.6 (–1.1) mm above sheath apex, sheath glabrous abaxially, ligule 0.9–3.9 (–6.6) mm long; bract blade of uppermost lateral spike 0.6–7.5 (–12.4) cm long and slightly exceeding terminal spike or rarely much exceeding terminal spike, sheath 1.4–7.1 mm long and glabrous; uppermost bract subtending terminal spike and scalelike, sheathless, body 3.4–5.1 mm long, awn 0.8–4.9 mm long. Spikes (3–) 4–5 (–6), simple, single at nodes, erect; terminal spike 0.7–3.7 (–4.6) cm long, the longest 1.2–3.7 (–4.6) cm long, 1.0–2.9 mm wide, entirely staminate, 11–94-flowered, on erect peduncle 1.6–22 (–51) mm long, usually barely exceeding upper lateral spikes; lowest spike 0.5–1.9 cm long, 4.6–7.0 mm wide, entirely pistillate, 3–10-flowered, the flowers spirally imbricate, the internode between the lowest flowers 1.8–3.3 (–6.2) mm long, on erect or arched peduncle 2.9–13.3 (–18.1) cm long; lateral spikes 0.7–2.6 cm long, 4.6–9.2 mm wide, entirely pistillate and 4–19-flowered or rarely androgynous with 3–17 pistillate and 2–16 staminate flowers, on erect peduncles 0.1–4.9 cm long. Staminate scales 3.3–4.8 mm long, 1.1–1.6 mm wide, narrowly oblong to oblong or oblong-ovate, acute to acuminate, awnless, center green and 1-nerved,

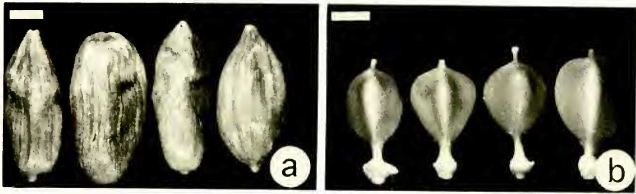


FIG. 3. Perigynia and achenes of members of the *Carex grisea* complex. a, front view of perigynia of (left to right) *C. amphibola* (Naczi 2557), *C. corrugata* (Naczi 1033), *C. godfreyi* (Naczi 2376), and *C. grisea* (Naczi 1854). b, front view of achenes (retaining portions of perigynium bases adnate to achene stipes) of (left to right) *C. amphibola* (Naczi 2557), *C. corrugata* (Naczi 1033), *C. godfreyi* (Naczi 2376), and *C. grisea* (Naczi 1854). Scale bars = 1 mm.

margins hyaline and whitish to stramineous or whitish with red-brown speckles. Pistillate scales 2.1–5.3 mm long, 1.2–2.4 mm wide; body 1.7–2.8 mm long, broadly ovate to ovate with midrib prolonged as antrorsely scaberulous awn (0–) 0.2–3.3 mm long, center green and 1–3-nerved, margins entire, hyaline, whitish and usually with red-brown speckles. Anthers 3, 2.0–2.8 mm long. Styles jointed with achenes, withering; stigmas 3, 1.8–2.7 mm long. Perigynia (4.0–) 4.3–5.0 (–5.6) mm long, 1.5–1.9 (–2.1) mm wide, 2.4–2.9 (–3.2) times as long as wide, ascending, obtusely trigonous with faces flat to slightly convex or rugose, with many fine and deeply impressed nerves on each face, the total number of nerves 52–64, glabrous, green to red-brown, ellipsoid or narrowly ellipsoid to obovoid or narrowly obovoid, very gradually tapered to broad and truncate base, gradually tapered to subacute and straight or slightly excurved apex, beakless or with minute beak; beaks 0–0.2 mm long, 0–0.03 of perigynium length, straight, entire. Achenes (3.0–) 3.1–3.5 (–3.7) mm long, 1.5–1.8 mm wide, loosely enveloped by perigynia, broadly obovoid to obovoid, obtusely trigonous with faces slightly concave to flat, brown, basally abruptly contracted to stipe, apically abruptly contracted to beak; stipe 0.6–0.8 (–0.9) mm long, straight; body 2.0–2.4 (–2.6) mm long, 0.43–0.53 times as long as perigynium, with widest point 0.7–1.1 (–1.2) mm from body apex; beak 0.3–0.6 mm long, usually vertical, but occasionally bent 10–30° from vertical.

REPRESENTATIVE SPECIMENS. FLORIDA. Bay Co.: 1 mi N of Bennett, in bottoms of Moccasin Creek, *McDaniel* 7378 (BRIT/SMU, FLAS, FSU, TENN, UNA, VDB, etb). Citrus Co.: Chassahowitzka, along Chassahowitzka River just W of county park, *Naczi* 2791 (MICH, etb). Clay Co.: ca. 1 mi N of Green Cove Springs. Magnolia Springs, 0.4 mi N of rte. 17, *Naczi* 2374 (MICH, etb), *Naczi* 2771 (MICH, etb); Magnolia, 17 Mar 1883, *J. D. Smith s.n.* (NY, US). Columbia Co.: Ichetucknee Springs, *Godfrey* 62661 & *Houk* (FSU, NCU); 3 mi W of Lula, *McDaniel* 6088 (NY, FLAS, FSU). Dixie Co.: ca. 1 mi N of Jena, near the Steinhatchee River, *Godfrey* 74658 (FLAS, FSU, MO, NCU, VDB); ca. 2.5 mi NE of Jena, 2.6 mi SW of jet. of rtes. 358 & 98, SE of rte. 358, *Naczi* 2376 (MICH, etb), *Naczi* 2796 (MICH, etb). Duval Co.: near Jacksonville, *Curtiss* 3267 (FLAS). *Curtiss* 4682 (F, FSU, MO, NY, US); ca. 2 mi W of Bayard along W side of Julington Creek, S of Old St. Augustine Rd., *Naczi* 2773 (MICH, etb). Gadsden Co.: near River Junction, *Curtiss* 6401 (BIL, CU, DOV, GH, ILL, MIN, MO, NY, US, WARM); near Chattahoochee, E side of Florida State Hospital Pond, *Gholson* 9655 & *Cameron* (FLAS, FSU). Hillsborough Co.: Hillsborough River State Park, *Bright* 456 (FLAS, PH), *Bright* 457 (CM), *Lakela* 25693 & *R. W. Long* (BRIT/SMU, FLAS, OKLA, USF). Jackson Co.: near Marianna, Florida Caverns State Park, *Gholson* 9606 (FSU), *Godfrey* 53180 (DUKE, FSU, GH); W of Malone, along Cowarts Creek, *Godfrey* 74825 (FSU); ca. 1 mi N of Marianna, N of rte. 167 along W side of Chipola River, *Naczi* 2106 (MICH, etb). Jefferson Co.:



Wacissa Springs, *Godfrey 53492* (DUKE, FSU, GH), *Godfrey 60798* (FSU), *Godfrey 60800* (NY), *Godfrey 74806* (FSU, VDB); E of Newport, 1 mi W of Aucilla River, by rte. 98, *Godfrey 75769* (FSU); E of Newport, 0.4 mi W of Aucilla River, by rte. 98, *Bryson 7920* (MICH, ctb), *Gholson 11299* (FLAS, ctb), *Godfrey 81821* & *Gholson* (FSU), *Godfrey 82028* & *Naczi* (FLAS, FSU), *McNeilus 90-125* (WARM), *Naczi 1109* & *Godfrey* (FSU, MICH, ctb), *Naczi 2098* (FLAS, FSU, MICH, US, VSC, ctb). Leon Co.: near Horne Springs, between springs and St. Marks River, *Godfrey 82007* (FLAS, FSU, VDB); ca. 0.5 mi S of Ochlockonee, *Harper 14* (BH, ILL, NY, US); ca. 1 mi W of Bloxham, E side of Ochlockonee River just S of rte. 20, *Naczi 2100* (MICH). Levy Co.: 2 mi S of Otter Creek, *Godfrey 74739* (FLAS, FSU); just E of Rosewood, 15 mi E of Cedar Key, *Kral 57328* (VDB). Liberty Co.: 8 mi E of Hosford, *McDaniel 5913* (FSU). Marion Co.: E of Silver Springs, *Orzell & Bridges 13296* (MICH). Martin Co.: Stuart and vicinity, Jan–Feb 1917, *Atwood s.n.* (CU). Nassau Co.: 1.8 mi N of Callahan along W side of rte. 1, *Naczi 2370* (FLAS, FSU, MICH, ctb), *Naczi 2371* (FLAS, FSU, MICH, VDB, VSC, ctb). Pasco Co.: E of Land o' Lakes, Cypress Creek Well-field, *Crewz 1563* (UNA, USF), 9 Apr 1979, *T. F. Rochow s.n.* (USF). St. Johns Co.: ca. 3 mi SE of Orangedale, S of rte. 16 along E side of Trout Creek, *Naczi 2778* (FLAS, FSU, MICH, VDB, VSC, ctb). Taylor Co.: rte. 98/19/27A at Steinhatchee River, *Gholson 6077* & *Godfrey* (FLAS); ca. 5.5 mi W of Hampton Springs along N side of rte. 98, *Naczi 2382* (MICH). Wakulla Co.: along the Wakulla River at Upper Bridge, *Godfrey 53090* (FSU, GA, GH, NY, USF, VDB); vicinity of St. Marks, *Godfrey 60666* (FSU), *Godfrey 60668* (FSU, GH, NY); Newport, along the St. Marks River, *Godfrey 61744* (FSU), *Godfrey 63258* (FLAS, FSU, LL, NCU, US, USF); bottoms of St. Marks River near north edge of county, *Harper 60* (GH, MIN, NY); ca. 0.7 mi N of Newport, just S of Newport Spring, *Naczi 2384* (FLAS, FSU, MICH, ctb). Washington Co.: N edge of Vernon, above Holmes Creek under hwy. 79 bridge, *Anderson 12629* (FSU, MICH).—GEORGIA. Calhoun Co.: 3 mi W of Leary, near Ichawaynochaway Creek, *Thorne 7995* & *Muenschner* (CU, GA). Early Co.: 4 mi E of Blakely, along Dry Creek, *Thorne 2948*, *Muenschner*, & *S. J. Smith* (CU, GA, GEO, GH). Lee Co.: near Armenia, along Fowltown Creek, *Thorne 9025* & *Muenschner* (CU, GEO).—NORTH CAROLINA. Jones Co.: 5 mi NE of Pollocksville, bank of Island Creek near co. rd. 1004, *Sears C179* (NLU). New Hanover Co.: Wilmington, Delgado, *Churchill 132* (GH).—SOUTH CAROLINA. Allendale Co.: Savannah River Operations Area of Atomic Energy Commission, 6 May 1952, *Batson & Kelley s.n.* (USCH).

*Carex godfreyi* belongs to a complex of four species, including *C. amphibola* Steud., *C. corrugata* Fern., and *C. grisea* Wahlenb. The characters that define the *C. grisea* complex are purple-red shoot bases (rarely brown in *C. amphibola* and *C. grisea*), loose leaf and bract sheaths, perigynia loosely enveloping the achenes, perigynia relatively long [(3.6–) 3.9–5.3 (–5.6) mm long], and perigynium length/achene body length ratio relatively high [(1.7–) 2.0–2.4 (–2.6)]. *Carex godfreyi* differs from all the other members of the *C. grisea* complex in several ways (Table 2). First, it is the only member of the complex that is loosely caespitose. Second, the purple-red coloration of the leaf sheaths and cataphylls extends higher from the shoot bases in *C. godfreyi* than in the three other species. Third, the leaf blades of *C. godfreyi* are narrower than those of the others. Finally, *C. godfreyi* has the longest achene stipes of any member of the complex (Fig. 3b). Within the *C. grisea* complex, *C. godfreyi* is morphologically most similar to *C. amphibola*. Both species possess relatively narrow perigynia with relatively high length/width ratios (Table 2, Fig. 3a).

*Carex godfreyi* inhabits wet hammocks, swamps, and floodplains dominated by deciduous trees. It grows in shaded, wet, calcareous mucks or sandy loams, often with *Acer rubrum* L., *Asclepias perennis* Walt., *Carex bromoides* Willd., *C. leptalea* Wahlenb., *Carpinus caroliniana*, *Platanthera flava* (L.) Lindl., *Rhaphidophyllum hystrix* (Pursh) Wendl. & Drude, *Rhynchospora miliacea* (Lam.) Gray, *Ruellia caroliniensis* (Gmel.) Steud., *Sabal minor* (Jacq.) Pers., *S. palmetto* Schult. & Schult., and *Samolus parviflorus* Raf. *Carex godfreyi* occurs on the Coastal Plain from southeastern North Carolina south to central peninsular Florida and west to southwestern Georgia and nearby portions of the panhandle of Florida.

TABLE 2. Morphologic characters distinguishing *Carex godfreyi* from the rest of the members of the *Carex grisea* complex.

	<i>C. godfreyi</i>	<i>C. amphibola</i>	<i>C. corrugata</i>	<i>C. grisea</i>
habit	densely to loosely caespitose	densely caespitose	densely caespitose	densely caespitose
purple-red coloration at plant base, height (mm)	(34-) 40-73	(0-) 10-24	(4-) 13-36 (-39)	0-32
widest leaf per plant, width (mm)	2.4-4.0 (-5.3)	4.4-6.8	3.3-5.6 (-8.0)	(4.8-) 5.0-6.8 (-9.1)
perigynium, width (mm)	1.5-1.9 (-2.1)	1.5-1.9 (-2.2)	(1.7-) 1.8-2.3 (-2.4)	(1.8-) 2.0-2.6
perigynium, length/width	2.4-2.9 (-3.2)	(2.2-) 2.5-3.1	1.8-2.3 (-2.5)	1.8-2.4 (-2.6)
achene stipe, length (mm)	0.6-0.8 (-0.9)	(0.3-) 0.4-0.6	(0.3-) 0.4-0.6	(0.2-) 0.3-0.4 (-0.5)

The populations of *C. godfreyi* are relatively few and often widely discontinuous, presumably due to the species' requirement for a specialized habitat. Only two collections are known from North Carolina, one from South Carolina, and a few from Georgia. *Carex godfreyi* is moderately frequent only in Florida.

The geographic range of *C. godfreyi* only partially overlaps the collective range of the other members of the *C. grisea* complex, *C. godfreyi* occurring farther south. In fact, only *C. godfreyi* and *C. corrugata* are sympatric, from southeastern North Carolina to northern Florida. Though *C. godfreyi* and *C. corrugata* have been collected within a few kilometers of each other at a few localities (in Jones and New Hanover counties, North Carolina, and Gadsden and Leon counties, Florida), apparently they never have been encountered at the same site. Syntopy of *C. godfreyi* and *C. corrugata* is unlikely because of the preference of *C. godfreyi* for mucks and sandy loams and *C. corrugata* for clays.

I name this species for Dr. Robert K. Godfrey in recognition of his many botanical contributions and in gratitude for his assistance with my field work, especially for showing me the first plants I saw of this species. Through tireless collecting (including many of the specimens of *C. godfreyi*), training many students, and publishing numerous works on the vascular plants of the Southeast, Dr. Godfrey has exponentially increased our understanding of the flora of the region, particularly the area inhabited by *C. godfreyi*.

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